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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/460,630	12/14/1999	BART DIERICKX	IMEC87.001CP	2743

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EXAMINER

LEE, EUGENE

ART UNIT PAPER NUMBER

2815

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/460,630

Applicant(s)

DIERICKX, BART

Examiner

Eugene Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/29/03 has been entered.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the amplifier must be shown or the feature(s) canceled from the claim(s). The figures only show a detection circuitry 32, however, the applicant has not defined this detection circuitry as an amplifier. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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4. Claims 1 thru 11 and 13 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not disclose the invention as comprising an amplifier integrated in the pixel structure for amplifying the collected charge.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4 thru 6, and 9 thru 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gowda et al. 6,115,066 in view of Chi et al. 5,608,243. Gowda discloses (see, for example, FIG. 5) an active pixel CMOS image sensor (CMOS pixel structure) comprising a p-type substrate (semiconductor substrate with dopants of a first conductivity type) 56, insulating layer, n well (collection region with dopants of a second conductivity type) 52, gate metallization (dual-purpose electrode) 51, and reference node (detection region) 25. The above-mentioned insulating layer is found in FET 22 (a FET comprises an insulating layer in between a gate metallization and substrate). In column 5, lines 45-67, Gowda states a photocharge collection period when the ROW SELECT is low (intended to be driven by a first voltage). In column 7, lines 60-63, Gowda states the ROW SELECT is brought high (a second voltage, which is higher

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than the first voltage, for transferring the charges from the collection region into a detection region) to transfer the photocharge to reference node 25. Gowda does not disclose an amplifier integrated in the pixel structure and coupled to the detection region for amplifying the collected charge. However, Chi discloses (see, for example, FIG. 2B) an active pixel sensor cell comprising a sense amplifier SA coupled to a region 106. The sense amplifier amplifies the output of the active pixel. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to include the amplifier of Chi in Gowda's invention in order to amplify the output of the active pixel.

Regarding claims 9-11, see p+ layer (pinning region) 54.

7. Claims 2, 3, 7, 8, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gowda et al. '066 in view of Chi et al. '243 as applied to claims 1, 4-6, and 9-11 above, and further in view of Kuroda et al. 4,630,091. Gowda in view of Chi does not disclose a barrier region of the first conductivity type with a concentration density of dopants being higher than the concentration density of dopants in the substrate. However, Kuroda discloses (see, for example, FIG. 5) a solid state image pickup element comprising a p+-type layer (barrier region) 13 surrounding an n-type region 5, 11. Kuroda teaches that providing such a layer will redirect a charge 14 to the photodiode 1. See, for example, column 2, lines 56-*. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the p+-type layer in Gowda in view of Chi in order to direct charges to the pn junction of the n well and consequently reduce smearing.

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Response to Arguments

8. Applicant's arguments with respect to claims 1-11 and 13 have been considered but are moot in view of the new ground(s) of rejection.

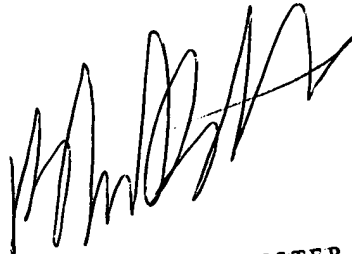
INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Eugene Lee
January 21, 2003



**B. WILLIAM BAUMEISTER
PRIMARY EXAMINER**